Knowles®

TB12

TECHNICAL BULLETIN

APPLICATION NOTES FOR BL SERIES MICROPHONES

General Description: A line of subminiature, piezoelectric microphones with integral amplifier stage for applications requiring high sensitivity, wide frequency range, small size, and high mechanical shock resistance. The sensitivity of these microphones is high enough so that a transistor stage can be omitted in some applications.

Typical Dimensions: (in inches)		Length	Width	Thickness
	BL-1670 Series	.312 max.	.220 max.	.163 max.
	BL-1680 Series	.312 max.	.220 max.	.090 max.

Nominal Sensitivity at 1000 Hertz re: 1 Volt/microbar with a Supply Voltage of 1.3 Volts d.c.

BL-1670	- 55.0dB	BL-1680	- 57.5dB
BL-1671	- 54.5dB	BL-1681	- 57.5dB
BL-1672	- 54.5dB	BL-1682	- 57.5dB

Note:
A change from 1.3 to 1.1 Volts d.c.shall cause not more than a 3.0dB decrease in 1 KHz output.

Nominal Impedance at 1000 Hertz: 13,000 ohms. (Range: 8,000 to 22,000 ohms .)

Battery Drain at 1.3 Volts d.c.: 50 microamps maximum.

d.c. Voltage at Output Terminals (See Fig. 1):

Negative Terminal Common - 0.2 to 0.9 Volts d.c.
Positive Terminal Common - 0.4 to -1.1 Volts d.c.

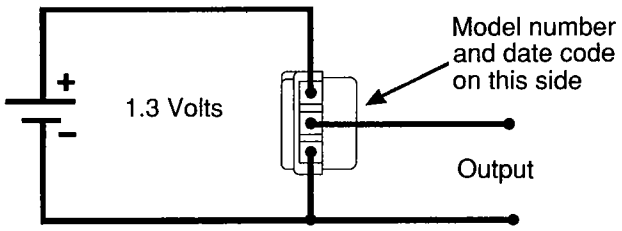

Figure 1 (Negative Terminal Common)

Case Grounding: No greater than 100 ohms d.c. resistance between case and negative terminal.

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Application: The circuit of Figure 2 will allow these units to be connected in place of most two-wire microphones. A load resistor R_L may be necessary to reduce the sensitivity to a suitable level, and will produce a d.c. current path for those circuits which presently depend on one through the microphone. Table 1 below provides a rough guide to the value of R_L required for a given reduction in sensitivity for all models. Low frequency response may be reduced by using coupling capacitor values of less than 1µfd.

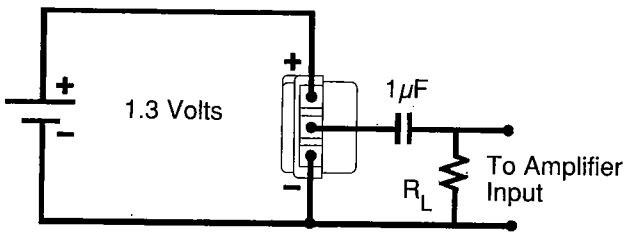

Figure 2

R_L (ohms)	Approximate Sensitivity Reduction (dB)
∞	0
15K	5
7K	10
3K	15
1.5K	20

Table 1

Since the microphone will be connected to the power supply, a portion of any alternating voltage present on the power supply (fed back from the amplifier) will appear at the output terminal of the microphone. This power supply feedthrough should be taken into account in the design of the amplifier, as it may affect the frequency response and stability of the amplifier.

Range of power supply feedthrough (e_o/e_{IN}) in Figure 3:

Negative Terminal Common: -17dB to -6dB
Positive Terminal Common: -1dB to -6dB

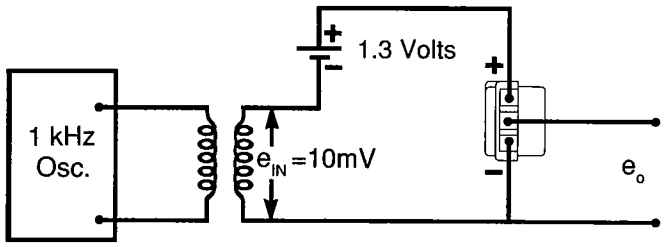

Figure 3

An RC decoupling network in series with the positive lead can be used to attenuate this effect. The suggested maximum value of R is 2000 ohms (to avoid excessive voltage drop at the BL terminals). The appropriate value of C can be determined experimentally.